IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Baxter et al.

Serial No.: 09/844,537

Filed: April 27, 2001

FOR: METHODS, SYSTEMS, AND COMPUTER PROGRAM PRODUCTS FOR COMMUNICATING WITH A CONTROLLER USING A DATABASE INTERFACE

Date: October 15, 2007

Mail Stop Appeal Brief-Patents Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF (PATENT APPLICATION--37 C.F.R. § 41.37)

1. concu	Transmitted herewith is the APPEAL BRIEF for the above-identified application, arrently filed with a Notice of Appeal.			
2.	This application	on is filed on behalf of a small entity.		
3.	Pursuant to 37	C.F.R. § 41.20(b)(2), the fe small entity other than small entity	e for filing the Appeal Brief is: \$255.00 \$510.00 Appeal Brief fee due \$10.00	
		 Please reapply previously paid notice of appeal fee and appeal brief fee as directed in the July 7, 2006 Official Action. Please charge Deposit Account No. 50-0220 in the amount of \$20.00 in accordance with September 30, 2007 fee increases and any other fee that may be required. 		
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PATENT

Attorney's Docket No.: 9266-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Baxter et al. Serial No.: 09/844,537 Filed: April 27, 2001 Group Art Unit: 2162 Confirmation No.: 3743 Examiner: Jean M. Corrielus

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APPELLANTS' BRIEF ON APPEAL

UNDER 37 C.F.R. §41.37

Sir:

This Appeal Brief is filed pursuant to the "Notice of Appeal to the Board of Patent Appeals and Interferences" filed October 15, 2007.

Real Party In Interest

The real party in interest is assignee Triangle Open Gateway Automation, L.L.C., Raleigh, North Carolina.

Related Appeals and Interferences

Appellants are aware of no appeals or interferences that would be affected by the present appeal.

Status of Claims

Appellants appeal the rejection of Claims 1 - 33, which as of the filing date of this Brief remain under consideration. Claims 1 - 33 stand rejected. Appellants submit that the claims involved in the appeal are independent Claims 1, 12, and 23 and rejected dependent Claims 2 - 11, 13 - 22, and 24 - 33 as a reversal of the rejection of independent Claims 1, 12,

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and 23 is requested in the present appeal and a reversal of the rejection of dependent Claims 2 - 11, 13 - 22, and 24 - 33 is also requested based, at least, on the reversal of the rejection of the independent claims. The claims at issue as included in Appellants' response to the Office Action of June 15, 2005 are attached hereto as Appendix A.

Status of Amendments

No responses after final rejection have been filed in the present case.

Summary of Claimed Subject Matter

Independent Claim 1 is directed to a method for communicating with a controller (controller 38, FIG. 4) in real-time by storing a command for the controller in a database (database 44, FIG. 4). The command may be a command to write a value of a real-time process control variable to the controller or a command to read a value of a real-time process control variable from the controller (command table 62, FIG. 4; Specification, page 8, lines 17 - 19). Upon detecting the stored command in the database, the stored command is sent to the controller (command interface module 86, communication driver 88, FIG. 4; Specification, page 9, lines 14 - 19).

Independent Claim 12 is directed to a system for communicating with a controller (controller 38, FIG. 4) in real-time comprising means for storing a command for the controller in a database. The database 44 and command table 62 of FIG. 4 provide structure corresponding to the means for storing a command recitation. The command is selected from the group of commands consisting of a write command that is configured to write a value of a real-time process control variable to the controller and a read command that is configured to read a value of a real-time process control variable from the controller (command table 62, FIG. 4; Specification, page 8, lines 17 - 19). The system further comprises means for detecting the stored command in the database and means for sending the detected command to the controller. The command interface module 86 of FIG. 4 (Specification page 9, lines 13 - 16) provides structure corresponding to the means for detecting recitation and the command interface module 86 and communication driver 88 of FIG. 4 (Specification, page 9, lines 14 - 19) provide structure corresponding to the means for sending recitation.

Independent Claim 23 is directed to computer program product for communicating with a controller (controller 38, FIG. 4) in real-time comprising a computer readable program

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medium having computer readable program code embodied therein (database 44, memory 74, FIG. 4), the computer readable program code comprising computer readable program code for storing a command for the controller in a database (database 44, command table 62, FIG. 4), wherein the command is selected from the group of commands consisting of a write command that is configured to write a value of a real-time process control variable to the controller and a read command that is configured to read a value of a real-time process control variable from the controller (command table 62, FIG. 4; Specification, page 8, lines 17 - 19). The computer program product further comprises computer readable program code for detecting the stored command in the database (command interface module 86, FIG. 4; Specification page 9, lines 13 - 16) and computer readable program code for sending the detected command to the controller (command interface module 86, communication driver 88, FIG. 4; Specification, page 9, lines 14 - 19).

Appellants refer to the description in the Specification at page 14, line 26 through page 15, line 19 for a description of the environment in which exemplary embodiments of the invention can be used. This description provides a context for the summary of the claimed subject matter set forth above.

Grounds of Rejection to be Reviewed on Appeal

Claims 1-5, 12-16, and 23-27 stand rejected under 35 U.S.C. §102(b) as anticipated by U. S. Patent No. 5,923,557 to 4,319,338 to Grudowski (hereinafter "Grudowski"). (July 13, 2007 Office Action (hereinafter "Office Action"), page 3).

Claims 6-11, 17-22, and 28-33 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Grudowski in view of U. S. Patent No. 5,396,485 to Ohno et al. (hereinafter "Ohno"). (Office Action, page 6).

Argument

I. Introduction to 35 U.S.C. §102/§103 Analysis

Under 35 U.S.C. § 102, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (quoting *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.O.2d 1051, 1053 (Fed. Cir. 1987)). "Anticipation under 35 U.S.C. § 102 requires the

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disclosure in a single piece of prior art of each and every limitation of a claimed invention." *Apple Computer Inc. v. Articulate Sys. Inc.*, 57 U.S.P.Q.2d 1057, 1061 (Fed. Cir. 2000). "The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." M.P.E.P. § 2112 (citations omitted).

A finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. See Scripps Clinic & Research Foundation v. Genentech Inc., 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). In particular, the Court of Appeals for the Federal Circuit held that a finding of anticipation requires absolute identity for each and every element set forth in the claimed invention. See Trintec Indus. Inc. v. Top-U.S.A. Corp., 63 U.S.P.Q.2d 1597 (Fed. Cir. 2002). Additionally, the cited prior art reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. In re Brown, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

A determination under §103 that an invention would have been obvious to someone of ordinary skill in the art is a conclusion of law based on fact. *Panduit Corp. v. Dennison Mfg. Co.* 810 F.2d 1593, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987), *cert. denied*, 107 S.Ct. 2187. After the involved facts are determined, the decision maker must then make the legal determination of whether the claimed invention as a whole would have been obvious to a person having ordinary skill in the art at the time the invention was unknown, and just before it was made. *Id.* at 1596. The United States Patent and Trademark Office (USPTO) has the initial burden under §103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988).

To establish a *prima facie* case of obviousness, the prior art reference or references when combined must teach or suggest all the recitations of the claims, and there must be some suggestion or motivation, either in the references themselves or in the knowledge

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generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. M.P.E.P. §2143. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. KSR Int'l Co. v. Teleflex Inc., 550 U. S. 1, 15 (2007). A corollary principle is that, when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be unobvious. Id. at 12. If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. Id. at 13. A Court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions. Id. at 13. When it is necessary for a Court to look at interrelated teachings of multiple patents, the Court must determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. Id. at 14.

Appellants respectfully submit that the independent claims are patentable over the cited reference for at least the reason that the cited reference does not disclose or suggest, among other things, storing a write command for a real-time process control variable or a read command for a real-time process control variable for a controller in a database and then detecting the stored command and sending the detected command to the controller. The patentability of the pending claims is discussed in detail hereinafter.

A. Independent Claims 1, 12, and 23 are Patentable over Grudowski

Independent Claims 1, 12, and 23 stand rejected under 35 U.S.C. §102 as being anticipated by Grudowski.

Independent Claims 1, 12, and 23 are directed to methods, systems, and computer program products for communicating with a controller in real-time. For example, Claim 1 recites:

storing a command for the controller in a database, wherein the command is selected from the group of commands consisting of a write command that is configured to write a value of a real-time process control variable to the controller and a read command that is configured to read a value of a real-time process control variable from the controller;

detecting the stored command in the database; and sending the detected command to the controller.

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Claims 12 and 23 include similar recitations.

Thus, according to the recitations of Claims 1, 12, and 23, a real-time process control variable write or read command for a controller is stored in a database. The stored command is detected and then sent to the controller. The Office Action cites the description at col. 12, lines 23 – 47 of Grudowski as disclosing the "storing a command" recitation of independent Claim 1. (Office Action, page 3). This passage of Grudowski, however, describes details of the ability of the programmable controller 9 to send messages containing commands or data to other stations, such as computer control system 7 and controllers 11 and 12, via the communication network 1, 2, 3, 4, 5 as shown in FIG. 2. (Grudowski, col. 10, line 60 – col. 11, line 15). Applicants submit that the random access memory 212 of programmable controller 9, which is where other stations on the communication network 1, 2, 3, 4, 5 write commands (Grudowski, col. 11, lines 16-20), is not a database as recited in independent Claim 1. For the sake of argument, even if the random access memory 212 of programmable controller 9 were to be interpreted as a database, the other stations 7, 11, and 12 on the communication network 1, 2, 3, 4, 5 do not write read and/or write commands that are used to read and/or write the value of a real time process control variable as recited in independent Claim 1. Grudowski does teach that a station 7, 11, and/or 12 may send a message to the programmable controller 9 to energize an operating device on the controlled machine via the I/O circuits 206 – 209, but turning on an operating device is not reading or writing the value of a real time variable associated with the operating device.

The Office Action cites col. 13, lines 1 - 17 of Grudowski as allegedly disclosing detecting the stored command in the database and sending the detected command to the controller as recited in Claim 1. This passage along with the passage beginning at col. 12, line 23 of Grudowski through the end of column describe the ability of the controller 9 to communicate with other stations 7, 11, and/or 12 on the communication network 1, 2, 3, 4, 5, not the ability to communicate with the operating devices on the controlled machine via the I/O circuits 206 - 209. (Grudowski, col. 13, lines 20 - 24).

For at least the foregoing reasons, Appellants respectfully submit that independent Claims 1, 12, and 23 are patentable over the cited reference and that dependent Claims 2 - 11, 13 - 22, and 24 - 33 are patentable at least by virtue of their depending from an allowable claim. Accordingly, Appellants respectfully request that the rejection of Claims 1 - 33 be

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reversed based on the failure of the Examiner to establish a prima facie case of anticipation under 35 U.S.C. §102 for at least these reasons.

В. Dependent Claims 6-11, 17-22, and 28-33 are Patentable

Dependent Claims 6-11, 17-22, and 28-33 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Grudowski in view of Ohno. (Office Action, page 6). Dependent Claims 6-11, 17-22, and 28-33 depend from independent Claims 1, 12, and 23, respectively, which Appellants have shown are patentable for at least the reasons discussed above in Section IA. Appellants submit that dependent Claims 6 - 11, 17 - 22, and 28 - 33are patentable over the cited references at least by virtue of their depending from an allowable claim. Ex parte Ligh, 159 U.S.P.Q. (BNA) 61, 62 (Bd. App. 1967). Accordingly, Appellants respectfully request that the rejection of Claims 6 - 11, 17 - 22, and 28 - 33 be reversed based on the failure of the Examiner to establish a prima facie case of obviousness under 35 U.S.C. §103 for at least these reasons

II. Conclusion

In summary, Appellants respectfully submit that, with respect to Claims 1 - 33 the cited reference does not teach all of the recitations of the claims. Accordingly, Appellants respectfully request reversal of the rejection of Claims 1 - 33 based on the cited reference. Moreover, Claims 1 – 33 satisfy the requirements of 35 U.S.C. §112 and 35 U.S.C. §101.

Respectfully submitted,

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APPENDIX A

1. (Previously Presented) A method of communicating with a controller in realtime, comprising:

storing a command for the controller in a database, wherein the command is selected from the group of commands consisting of a write command that is configured to write a value of a real-time process control variable to the controller and a read command that is configured to read a value of a real-time process control variable from the controller;

detecting the stored command in the database; and sending the detected command to the controller.

2. (Previously Presented) The method of Claim 1, wherein detecting the stored command comprises:

verifying that the stored command is a valid command for the controller.

3. (Original) The method of Claim 1, wherein sending the retrieved command to the controller comprises sending a write command that is configured to write a first value of a first real-time process control variable to the controller, the method further comprising:

sending a read command that is configured to read the first value of the first real-time process control variable to the controller responsive to sending the write command that is configured to write the first value of the first real-time process control variable to the controller.

4. (Original) The method of Claim 1, further comprising:

receiving a response from the controller responsive to sending the retrieved command to the controller; and

updating a status of the retrieved command sent to the controller in a command table in the database to indicate whether the retrieved command sent to the controller succeeded or failed.

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5. (Original) The method of Claim 4, wherein sending the retrieved command to the controller comprises sending a read command that is configured to read a first value of a first real-time process control variable from the controller, the method further comprising:

updating a current value associated with the first real-time process control variable in a tag table in the database with the first value of the first real-time process control variable read from the controller responsive to receiving the response from the controller.

6. (Original) The method of Claim 1, further comprising:

providing a tag table in the database that comprises definitions of a plurality of realtime process control variables, wherein each of the plurality of real-time process control variables is associated with a monitoring frequency and a current value;

periodically sending a read command that is configured to read a value of a real-time process control variable for respective ones of the plurality of real-time process control variables from the controller based on the respective monitoring frequencies; and

updating the respective current values for respective ones of the plurality of real-time process control variables with the respective values of the real-time process control variables read from the controller.

7. (Original) The method of Claim 6, further comprising:

providing a log module table in the database that comprises a list of at least one of the real-time process control variables defined in the tag table, wherein the at least one real-time process control variable is associated with a logging criterion; and

periodically reading the tag table for the at least one real-time process control variable in the log module table to obtain a current value associated therewith based on the logging criterion.

8. (Original) The method of Claim 7, further comprising: comparing an age of the current value associated with the at least one real-time process control variable with a predefined age threshold;

storing the current value for the at least one real-time process control variable in a historical log table if the age of the current value associated with the at least one real-time process control variable does is less than the predefined age threshold; and

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sending a read command that is configured to read a value of the at least one real-time process control variable from the controller if the current value for the at least one real-time process control variable is greater than or equal to the predefined age threshold.

9. (Original) The method of Claim 7, wherein the logging criterion is selected from the group consisting of a monitoring frequency, an event trigger, a percent change in value, and a client request.

10. (Original) The method of Claim 6, further comprising:

providing an event module table in the database that comprises a definition of at least one event based on at least one of the real-time process control variables defined in the tag table, wherein the at least one event is associated with at least one of a notification method and a stored procedure;

monitoring the current value of the at least one real-time process control variable to determine if the at least one event has occurred; and

performing at least one of the notification method and the stored procedure if the at least one event has occurred.

11. (Original) The method of Claim 10, further comprising:
providing an event log table in the database; and
saving the current value of the at least one real-time process control variable in the
event log table if the at least one event has occurred.

12. (Previously Presented) A system for communicating with a controller in realtime, comprising:

means for storing a command for the controller in a database, wherein the command is selected from the group of commands consisting of a write command that is configured to write a value of a real-time process control variable to the controller and a read command that is configured to read a value of a real-time process control variable from the controller;

means for detecting the stored command in the database; and means for sending the detected command to the controller.

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13. (Previously Presented) The system of Claim 12, wherein the means for detecting the stored command comprises:

means for verifying that the stored command is a valid command for the controller.

14. (Original) The system of Claim 12, wherein the means for sending the retrieved command to the controller comprises means for sending a write command that is configured to write a first value of a first real-time process control variable to the controller, the system further comprising:

means for sending a read command that is configured to read the first value of the first real-time process control variable to the controller responsive to the means for sending the write command that is configured to write the first value of the first real-time process control variable to the controller.

15. (Original) The system of Claim 12, further comprising:

means for receiving a response from the controller responsive to sending the retrieved command to the controller; and

means for updating a status of the retrieved command sent to the controller in a command table in the database to indicate whether the retrieved command sent to the controller succeeded or failed.

16. (Original) The system of Claim 15, wherein the means for sending the retrieved command to the controller comprises means for sending a read command that is configured to read a first value of a first real-time process control variable from the controller, the system further comprising:

means for updating a current value associated with the first real-time process control variable in a tag table in the database with the first value of the first real-time process control variable read from the controller responsive to the means for receiving the response from the controller.

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17. (Original) The system of Claim 12, further comprising:

means for providing a tag table in the database that comprises definitions of a plurality of real-time process control variables, wherein each of the plurality of real-time process control variables is associated with a monitoring frequency and a current value;

means for periodically sending a read command that is configured to read a value of a real-time process control variable for respective ones of the plurality of real-time process control variables from the controller based on the respective monitoring frequencies; and

means for updating the respective current values for respective ones of the plurality of real-time process control variables with the respective values of the real-time process control variables read from the controller.

18. (Original) The system of Claim 17, further comprising:

means for providing a log module table in the database that comprises a list of at least one of the real-time process control variables defined in the tag table, wherein the at least one real-time process control variable is associated with a logging criterion; and

means for periodically reading the tag table for the at least one real-time process control variable in the log module table to obtain a current value associated therewith based on the logging criterion.

19. (Original) The system of Claim 18, further comprising:

means for comparing an age of the current value associated with the at least one realtime process control variable with a predefined age threshold;

means for storing the current value for the at least one real-time process control variable in a historical log table if the age of the current value associated with the at least one real-time process control variable does is less than the predefined age threshold; and

means for sending a read command that is configured to read a value of the at least one real-time process control variable from the controller if the current value for the at least one real-time process control variable is greater than or equal to the predefined age threshold.

20. (Original) The system of Claim 18, wherein the logging criterion is selected from the group consisting of a monitoring frequency, an event trigger, a percent change in value, and a client request.

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21. (Original) The system of Claim 17, further comprising:

means for providing an event module table in the database that comprises a definition of at least one event based on at least one of the real-time process control variables defined in the tag table, wherein the at least one event is associated with at least one of a notification method and a stored procedure;

means for monitoring the current value of the at least one real-time process control variable to determine if the at least one event has occurred; and

means for performing at least one of the notification method and the stored procedure if the at least one event has occurred.

- 22. (Original) The system of Claim 21, further comprising: means for providing an event log table in the database; and means for saving the current value of the at least one real-time process control variable in the event log table if the at least one event has occurred.
- 23. (Previously Presented) A computer program product for communicating with a controller in real-time, comprising:

a computer readable program medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code for storing a command for the controller in a database, wherein the command is selected from the group of commands consisting of a write command that is configured to write a value of a real-time process control variable to the controller and a read command that is configured to read a value of a real-time process control variable from the controller;

computer readable program code for detecting the stored command in the database; and

computer readable program code for sending the detected command to the controller.

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24. (Previously Presented) The computer program product of Claim 23, wherein the computer readable program code for detecting the stored command comprises:

computer readable program code for verifying that the stored command is a valid command for the controller.

25. (Original) The computer program product of Claim 23, wherein the computer readable program code for sending the retrieved command to the controller comprises computer readable program code for sending a write command that is configured to write a first value of a first real-time process control variable to the controller, the computer program product further comprising:

computer readable program code for sending a read command that is configured to read the first value of the first real-time process control variable to the controller responsive to the computer readable program code for sending the write command that is configured to write the first value of the first real-time process control variable to the controller.

26. (Original) The computer program product of Claim 23, further comprising: computer readable program code for receiving a response from the controller responsive to sending the retrieved command to the controller; and

computer readable program code for updating a status of the retrieved command sent to the controller in a command table in the database to indicate whether the retrieved command sent to the controller succeeded or failed.

27. (Original) The computer program product of Claim 26, wherein the computer readable program code for sending the retrieved command to the controller comprises computer readable program code for sending a read command that is configured to read a first value of a first real-time process control variable from the controller, the computer program product further comprising:

computer readable program code for updating a current value associated with the first real-time process control variable in a tag table in the database with the first value of the first real-time process control variable read from the controller responsive to the computer readable program code for receiving the response from the controller.

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28. (Original) The computer program product of Claim 23, further comprising: computer readable program code for providing a tag table in the database that comprises definitions of a plurality of real-time process control variables, wherein each of the plurality of real-time process control variables is associated with a monitoring frequency and a current value;

computer readable program code for periodically sending a read command that is configured to read a value of a real-time process control variable for respective ones of the plurality of real-time process control variables from the controller based on the respective monitoring frequencies; and

computer readable program code for updating the respective current values for respective ones of the plurality of real-time process control variables with the respective values of the real-time process control variables read from the controller.

29. (Original) The computer program product of Claim 28, further comprising: computer readable program code for providing a log module table in the database that comprises a list of at least one of the real-time process control variables defined in the tag table, wherein the at least one real-time process control variable is associated with a logging criterion; and

computer readable program code for periodically reading the tag table for the at least one real-time process control variable in the log module table to obtain a current value associated therewith based on the logging criterion.

30. (Original) The computer program product of Claim 29, further comprising: computer readable program code for comparing an age of the current value associated with the at least one real-time process control variable with a predefined age threshold; computer readable program code for storing the current value for the at least one real-time process control variable in a historical log table if the age of the current value associated with the at least one real-time process control variable does is less than the predefined age threshold; and

computer readable program code for sending a read command that is configured to read a value of the at least one real-time process control variable from the controller if the

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current value for the at least one real-time process control variable is greater than or equal to the predefined age threshold.

- 31. (Original) The computer program product of Claim 29, wherein the logging criterion is selected from the group consisting of a monitoring frequency, an event trigger, a percent change in value, and a client request.
- 32. (Original) The computer program product of Claim 28, further comprising: computer readable program code for providing an event module table in the database that comprises a definition of at least one event based on at least one of the real-time process control variables defined in the tag table, wherein the at least one event is associated with at least one of a notification method and a stored procedure;

computer readable program code for monitoring the current value of the at least one real-time process control variable to determine if the at least one event has occurred; and computer readable program code for performing at least one of the notification method and the stored procedure if the at least one event has occurred.

33. (Original) The computer program product of Claim 32, further comprising: computer readable program code for providing an event log table in the database; and computer readable program code for saving the current value of the at least one real-time process control variable in the event log table if the at least one event has occurred.

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APPENDIX B – EVIDENCE APPENDIX

None

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APPENDIX C – RELATED PROCEEDINGS APPENDIX

None